

On-Board Testing and Diagnostics An Instrument Developer's Perspective

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Working with the parSYNC[®] Partnership³

Research Overview for FiA Foundation Seminar

'Can we prevent another dieselgate?'

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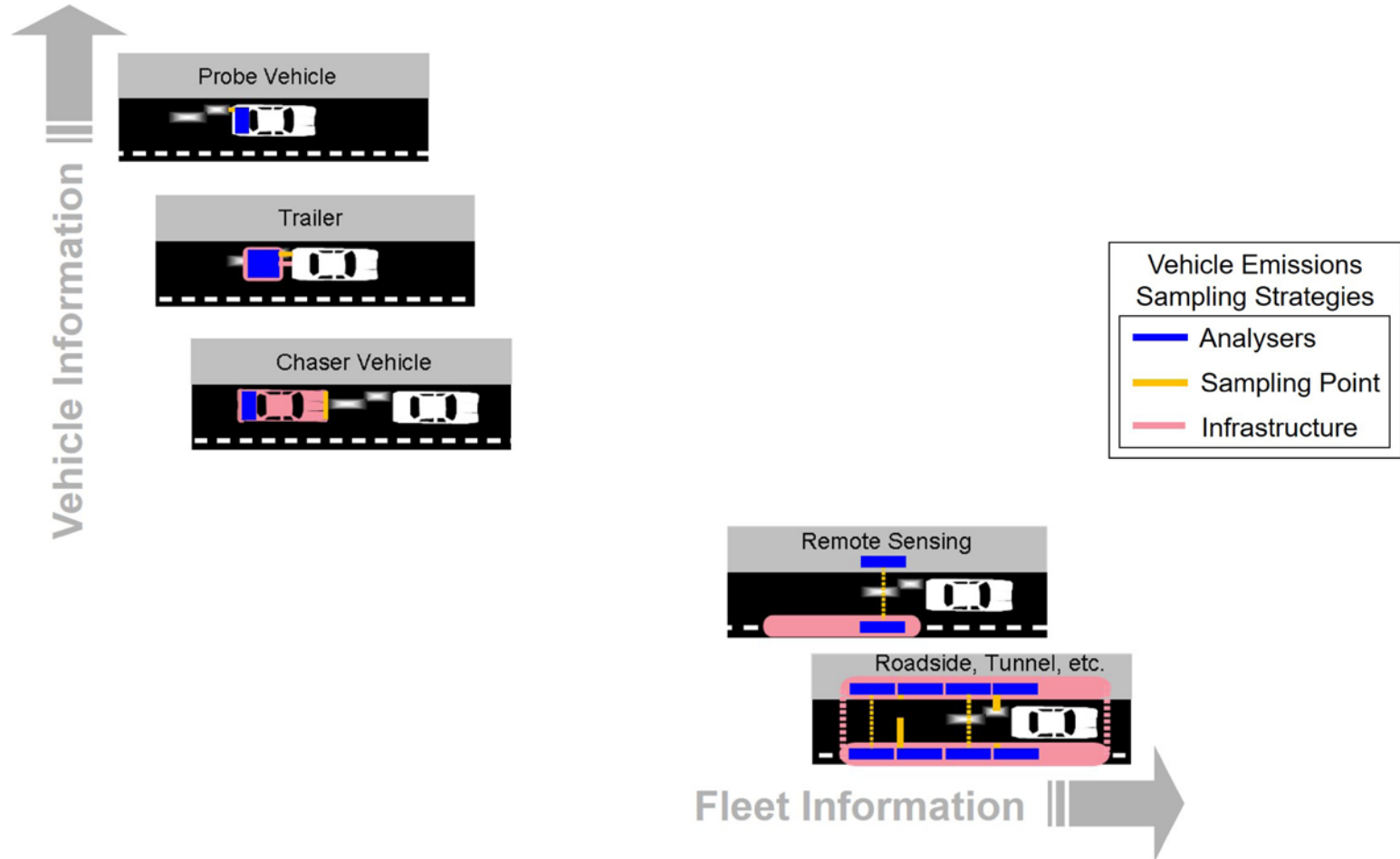


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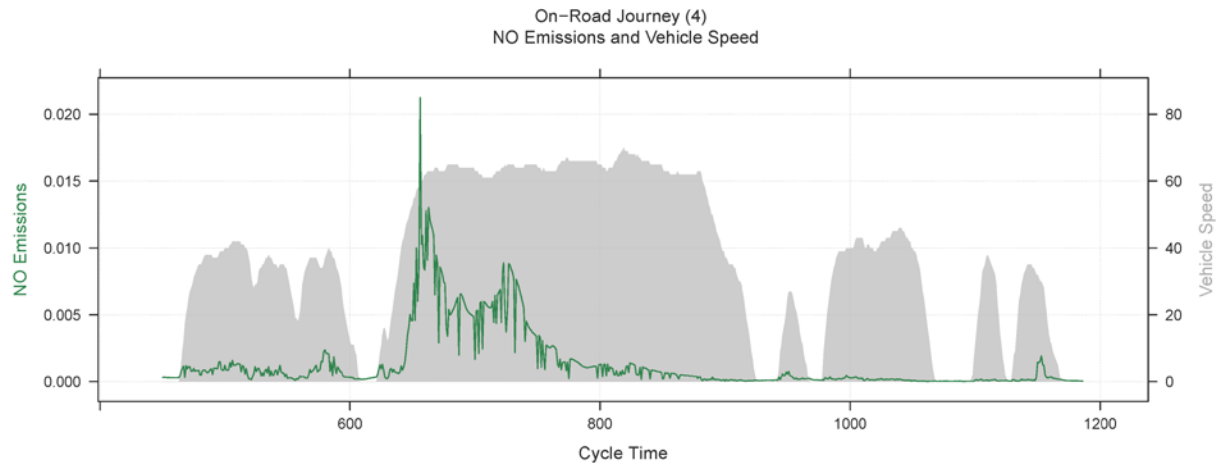
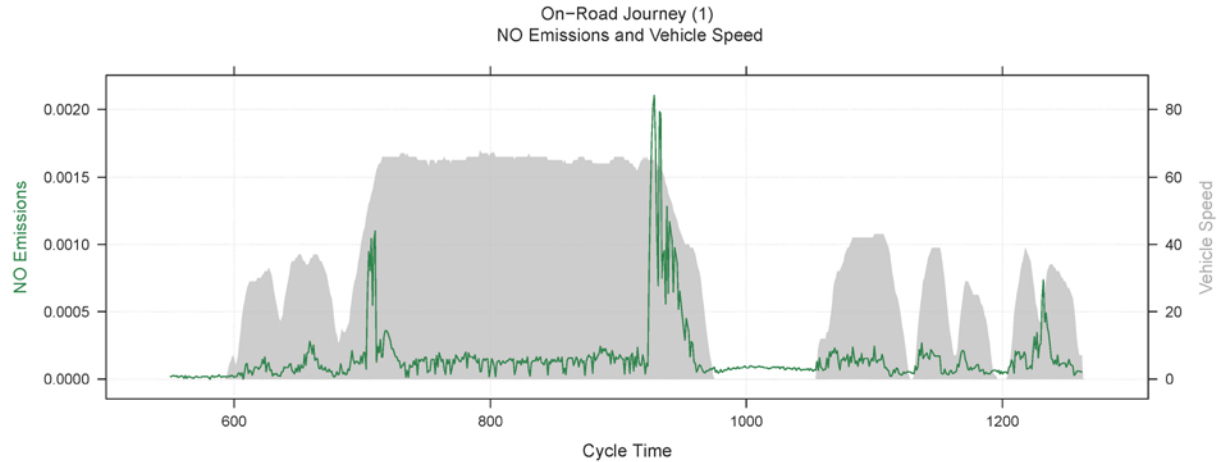
Real-world Emissions Methods



(From Ropkins, K. Real-time Mobile Monitoring of Vehicle Emissions. Royal Society of Chemistry AAMG Air Analysis Out of the Laboratory and into the Field, National Physical Laboratory, UK, 2008.)



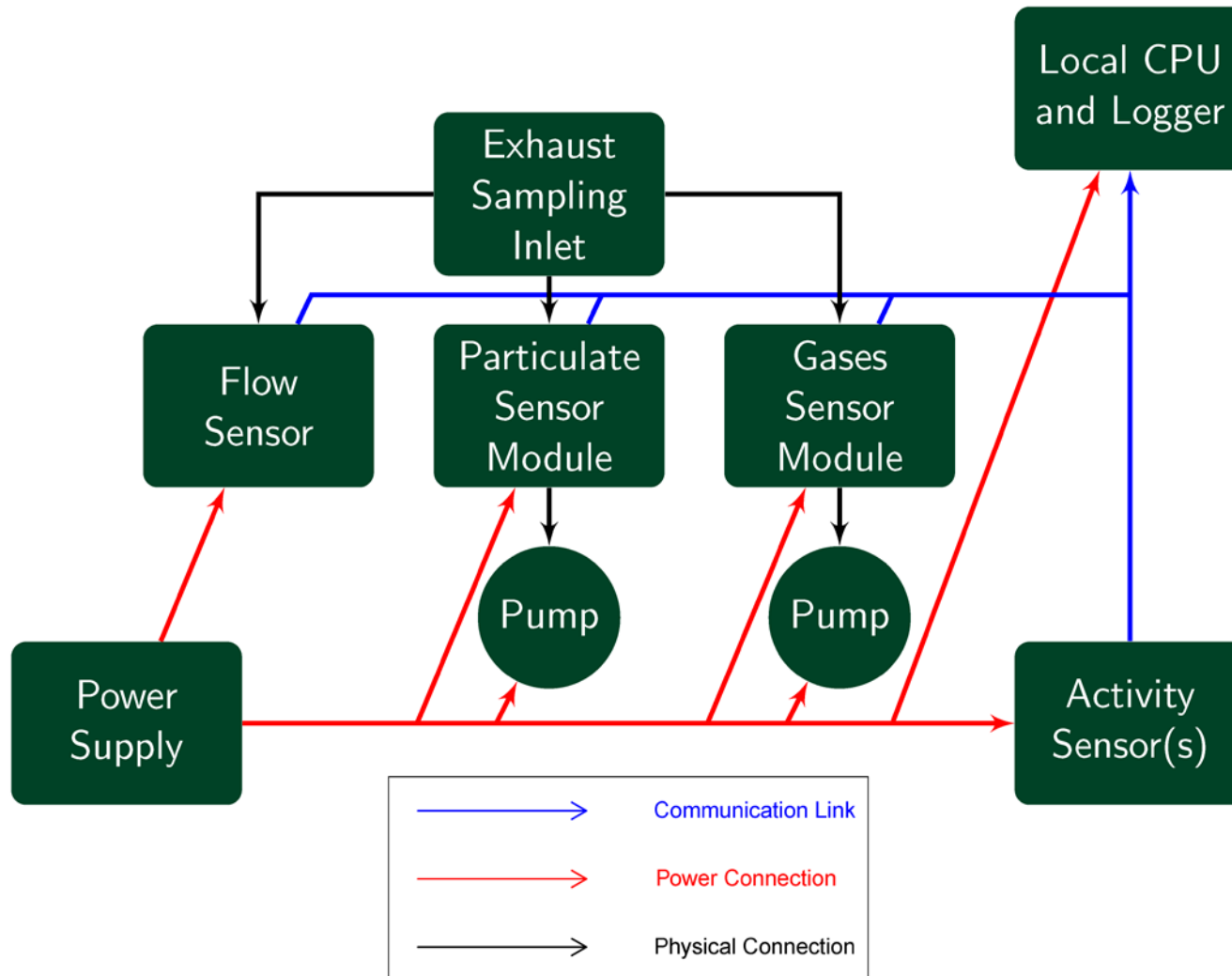
A Comment about Defeat Devices



It does not need a very accurate PEMS to see a defeat device - *but it does need a PEMS in the car with a defeat device...*

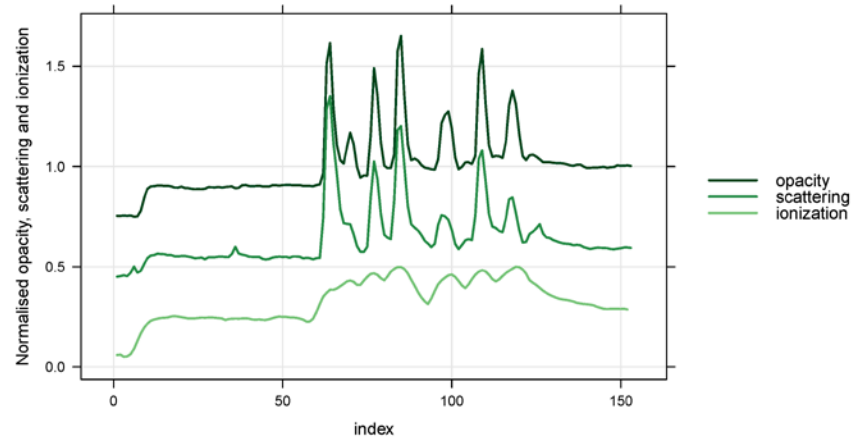
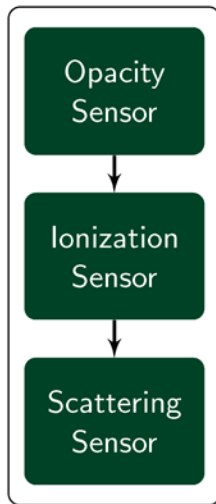
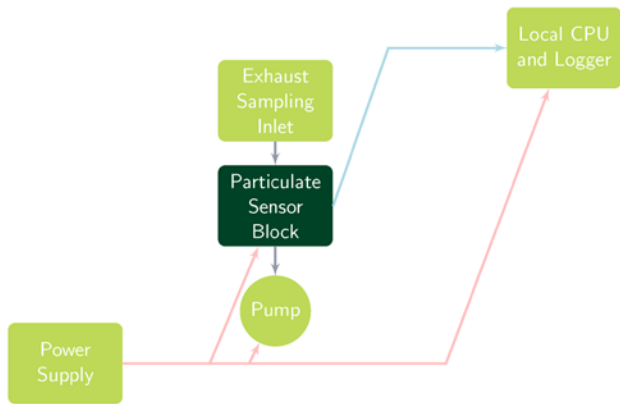


iPEMS: Modular Design

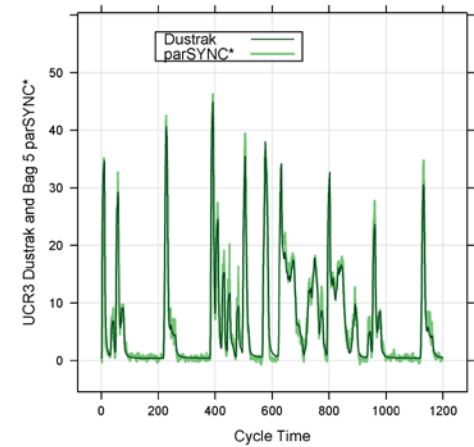
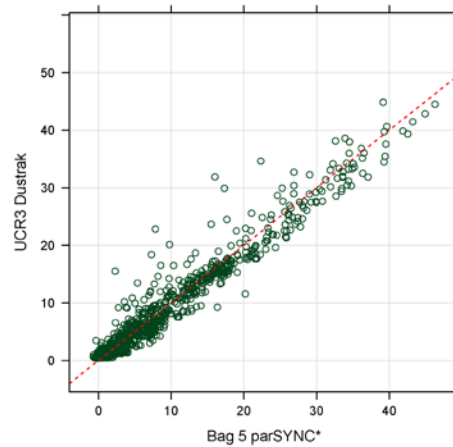




parSYNC[®] Sensor Module



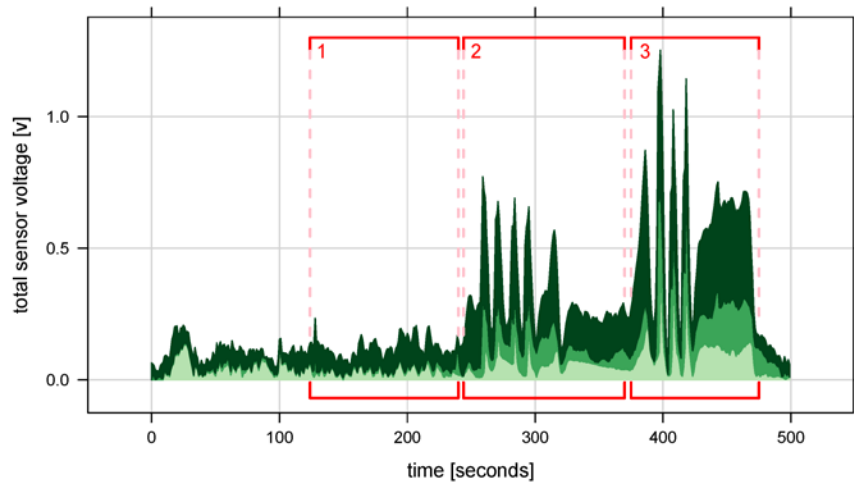
$$\text{Sensor Fit parSYNC}^* = [\text{REF}] = \sum f(\text{parSYNC}n_{t=-1,0,1})$$



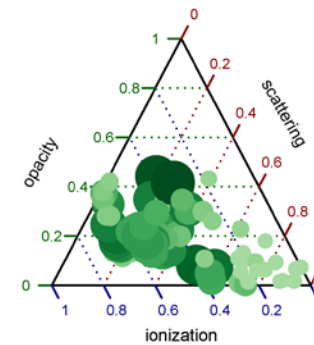
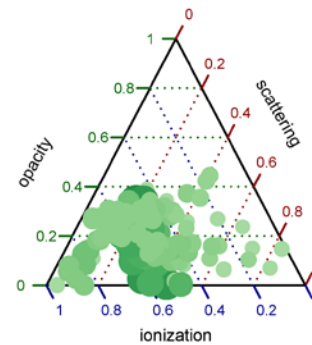
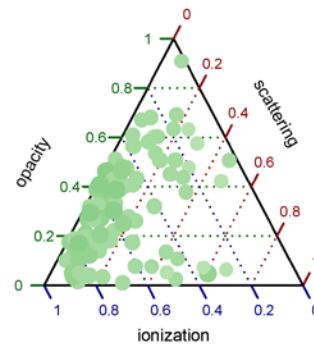
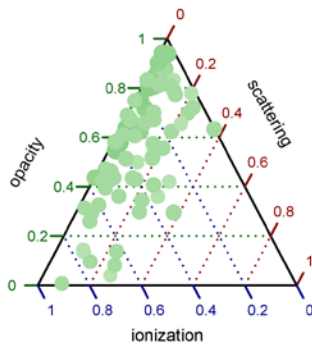
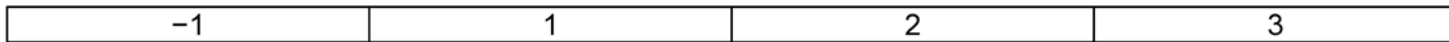
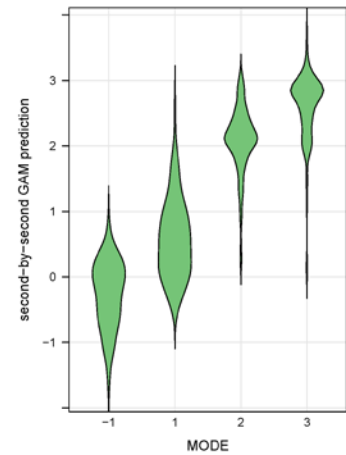


Application: DPF Failure Testing

Test vehicle with modified DPF; modes 1 (working) to 3 (failed)



sensors
ionization
scattering_x20
opacity_x20

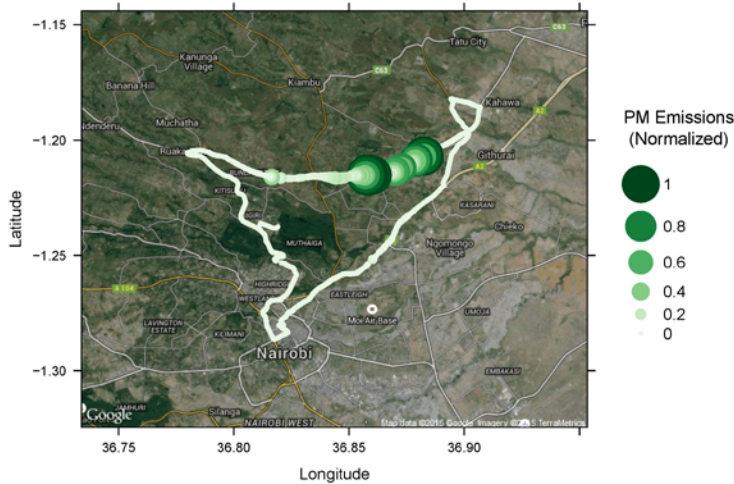


PSN





Demonstrator Work



(Recent) Third-party deployment

- Working with University of YORK/SEI
- African/Kenyan PEMS field study
- 'PEMS by Post' proof of concept

(Current) Small vehicle deployment

- Motorcycle field study
- Small instrument footprint
- High in-use stress/strain
- Move towards 'wrap around' solution



From: Work by Karim/CARB



Thank You

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